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## DECEMBER 7.

The President, Dr. RUSCHENBERGER, in the chair.

Twenty-three persons present.

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## DECEMBER 14.

The President, Dr. RUSCHENBERGER, in the chair.

Thirty-two persons present.

A paper entitled "On some Lower Eocene Mollusca from Clarke Co., Alabama, with some points as to the stratigraphical position of the beds containing them," by Angelo Heilprin, was presented for publication.

*The Phalanges of Bats.*—Dr. ALLEN, in reviewing the manner after which the phalanges in mammalia are enumerated, spoke of the propriety of including the terminal cartilaginous tip to the fingers, present in many bats, in the series of phalanges.

Authors do not hesitate in naming the terminal cartilage to the second finger in *Rhinopoma* a phalanx, nor should they, Dr. Allen held, hesitate in so including the terminal segments in other genera. It is interesting to observe that in *Molossus perotis* the terminal joint in the second finger is bony, and ankylosed to the first phalanx. If this plan of numbering the phalanges in bats be accepted, from one to three joints are present in all the fingers. The position taken by recent writers that the Phyllostomidae are distinguished from other families by the presence of the third phalanx to the third finger cannot be sustained, since this phalanx can be counted in other families, the terminal joint, however, remaining in them cartilaginous.

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## DECEMBER 21.

The President, Dr. RUSCHENBERGER, in the chair.

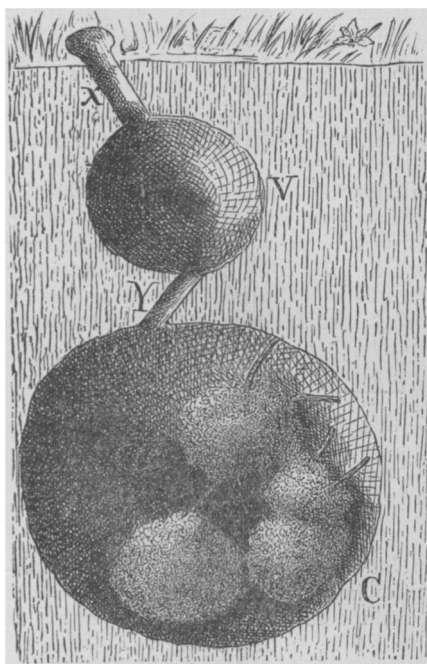
Ten persons present.

*Note on a new Northern Cutting Ant, Atta septentrionalis.*—Dr. McCook remarked that he had the pleasure of announcing an interesting discovery of a species of cutting ant upon the eastern central coast of the State of New Jersey. The discovery was made by Rev. George K. Morris at a new watering place called Island Heights, which is located upon a swelling bluff on the northern bank of Tom's River, near its mouth, three miles from the Atlantic Ocean, in about Lat. 40° N.

Mr. Morris, who has been much interested in noting the habits of ants, observed this species carrying the needle-like leaves of the pine into their nests, and thereupon followed their behavior until he found it to be quite like that of the cutting ant of Texas, *Atta fervens*. Dr. McCook having been informed of the above discovery, made a journey to Island Heights in the early part of September, 1880. Unfortunately a severe eastern storm set in before the train reached Tom's River, and continued during his stay with such rigor as utterly to preclude observation of the out-door behavior of the ants. However, by working in the storm, protected by rubber garments and a temporary shelter, he was able to make a study of the internal architecture of a nest.

The opening from the surface appeared to be a single narrow tubular gallery, *X*, of about two inches in length, which penetrated the ground at an angle of near  $45^\circ$ , and entered a spherical chamber, *V*—a sort of vestibule—about  $1\frac{1}{2}$  inches in diameter. Within this a few ants were found, nothing more.

This vestibule communicated by a short gallery, *Y*, with a



second chamber or cell, *C*, having generally a spherical shape, but more irregular in outline than the vestibule. It was about 3 in. in diameter. Within this were several small masses of an ashen-gray, fibrous pulp or papery material, closely resembling that found by him in the large cells or caves of the Texas cutting ant.<sup>1</sup> This was evidently the leaf-paper formed by the manducation of the pine leaves. It was exceedingly fragile, even more so than the leaf-paper of the Texas *Atta*, and could not be kept together in the original mass for examination. It appeared, however, to be without the decided cellular arrangement first observed by him in the leaf-paper of the Texas ant,

whose "combs"—the analogue of those of other hymenopters, as

<sup>1</sup> Proc. Acad. Nat. Sci. Phila., 1879, p. 37.

the bee and wasp—were composed of irregular hexagonal cells of various sizes.

None of these leaf-paper masses exceeded an inch in height; they lay upon the floor of the cave, *C*, or were upheld by the filamentous rootlets which penetrated within the hollow, or, more properly speaking, around which the cave had been formed. In this respect also the habit of the northern ant resembles that of the southern. Although, as said, the out-door behavior of the ant could not be observed by Mr. McCook, the insects having all been driven in-doors by the storm, these were observed to some extent by Mr. Morris, the discoverer, during the summer. Mrs. Mary Treat also visited the Heights and noted the same. From verbal reports received from these persons the analogy between the two insects, in respect of gathering and transporting leaves, appears to be quite close. There are many points, however, which remain to be determined accurately, which it is to be hoped will be done next summer.

The following account was communicated to the speaker by Mr. Morris, and is incorporated, by his permission, in this note:—

“In answer to your questions I would say, when first observed, there were two columns, one going each way, and moving very deliberately. If alarmed by any rudeness on my part, they sought safety by remaining perfectly motionless for some time, making it difficult to find them, as they are nearly the color of the dry leaves.

“Those in the column going homeward were carrying little pieces of the pine needle or leaf, cut from seedling plants about 2 inches high and upwards. In some instances the piece of leaf was not as long as the ant itself, but in others it was longer than the bearer. The appearance presented by the column was very singular, for instead of carrying their burdens as other ants do, so far as I have observed, they bore the load on the head, resting in a saddle-like, V-shaped space between ridges on the head, running from the base of the mandible on each side to the top of the head. One end was held firmly by the mandibles. The effect at a little distance was to give them a ‘shoulder arms’ appearance.

“Tracing the column back, I readily found their foraging ground a few feet from the formicary. There were the remains of several seedling pines which had been stripped and cut down nearly to the ground. Some ants were at work on the only one left standing, and I enjoyed the pleasure of witnessing their operations. There lay on the ground a few pieces, which were picked up, as I watched, and carried away. On the plant there were two at work cutting. Climbing out on a leaf to a position near the end, the ant applied her mandibles, and moved around as she cut, until the piece was severed, when she repeated the process, in most cases allowing the severed pieces to fall. One cutter held on to her last

cutting, backed down with it, and started off home. In no instance have I ever found one of these ants carrying a load of any kind in any other way than as described above. Your account of the Texas ant would answer as well for this.

"The little leaf-cutters at Island Heights have no mounds at the entrance to their formicaries. I found many nests, but none with a mound. The sand pellets in every case where I found ants at work were carried off several inches distant on every side and scattered, as if for secrecy. The ants' movements were exceedingly deliberate, always. Some seemed overloaded and rested often, but never laid down their load.

"All the colonies were comparatively small. I was unable to find any indication that they were connected one with another.

"There is not, so far as my observations go, any elaborate opening and closing of gates, such as you describe, but in wet weather I usually found a leaf over the entrance to their nest.

"The architecture of their caves is a miniature copy of that of your Texas cutting ant.

"I found them cutting only the pine leaf and the leaf of a small shrub called Cow Wheat (*Melampyrum americanum*). Of this plant they took the petals also. They carried the dry curled leaf as well as the green and freshly cut.

"They also carry and incorporate into the nest material the droppings of certain larvæ that feed on oak leaves."

Mr. Morris observed at the same place a second and larger form of leaf-cutting ant, which he thinks to be a distinct species; but as he was not able to point out any of the nests to Mr. McCook and has not yet made thorough examination, this point remains to be solved.

The ant whose economy is described above closely resembles the famous *Atta fervens* of our southern regions, having the same leaf-brown color and the same characteristic spines. It is distinguished by a black longitudinal band along the median dorsal part of the abdomen, and by a similar band along the middle part of the face, marking the furrow formed by two ridges, the prolongation (apparently) of the antennal ridges to the vertex of the caput. A double row of spines extends along the entire thorax and nodes, expanding at the prothorax into about four. Two castes of workers were found, appearing to be the workers major and minor, in length respectively 4 and 3 millimetres, or about one-sixth and one-eighth of an inch. The species appears to be new, and Dr. McCook at least ventured conditionally to name it the Northern Cutting Ant—*Atta septentrionalis*.

The discovery at so northern a point of this species, with habits quite identical with those of tropical congeners, seemed to the speaker to be a remarkably interesting fact in the distribution of our ant fauna. He was at once impressed by the striking contrast between the vast myriads of workers, the extensive excavations, and the formidable and vigorous activities of the Texas colonies,

and the small numbers, slight excavations and apparently sluggish movements of their northern allies. And he could not forbear the thought that these New Jersey communities of *Atta septentrionalis* seemed like the feeble remnant of a vigorous race left or thrust by some untoward change upon unfavorable sites, which must work toward their extinction.

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DECEMBER 28.

The President, Dr. RUSCHENBERGER, in the chair.

Eighty persons present.

The following papers were presented for publication :—